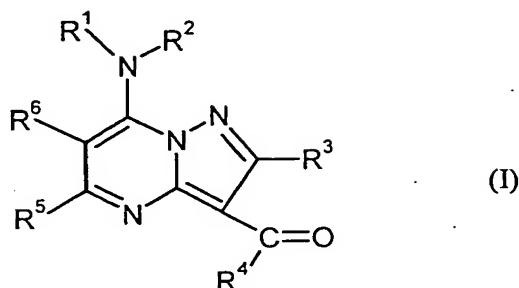


Claims

1. A pyrazolopyrimidine of the formula



in which

- 5 R^1 represents optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl or represents optionally substituted heterocyclyl,
- R^2 represents hydrogen or alkyl, or
- 10 R^1 and R^2 together with the nitrogen atom to which they are attached represent an optionally substituted heterocyclic ring,
- R^3 represents hydrogen, halogen, optionally substituted alkyl or optionally substituted cycloalkyl,
- R^4 represents substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl or optionally substituted benzyl,
- 15 R^5 represents halogen, optionally substituted alkyl, optionally substituted alkoxy, optionally substituted alkylthio, optionally substituted alkylsulfinyl or optionally substituted alkylsulfonyl and
- R^6 represents optionally substituted aryl.
2. The pyrazolopyrimidine of the formula (I) as claimed in claim 1
- 20 R^1 represents alkyl having 1 to 6 carbon atoms which may be mono- to penta-substituted by identical or different substituents from the group consisting of halogen, cyano, hydroxyl, alkoxy having 1 to 4 carbon atoms and cycloalkyl having 3 to 6 carbon atoms, or

- R^1 represents alkenyl having 2 to 6 carbon atoms which may be mono- to trisubstituted by identical or different substituents from the group consisting of halogen, cyano, hydroxyl, alkoxy having 1 to 4 carbon atoms and cycloalkyl having 3 to 6 carbon atoms, or
- 5 R^1 represents alkynyl having 3 to 6 carbon atoms which may be mono- to trisubstituted by identical or different substituents from the group consisting of halogen, cyano, alkoxy having 1 to 4 carbon atoms and cycloalkyl having 3 to 6 carbon atoms, or
- 10 R^1 represents cycloalkyl having 3 to 6 carbon atoms which may be mono- to trisubstituted by identical or different substituents from the group consisting of halogen and alkyl having 1 to 4 carbon atoms, or
- 15 R^1 represents saturated or unsaturated heterocyclyl having 5 or 6 ring members and 1 to 3 heteroatoms, such as nitrogen, oxygen and/or sulfur, where the heterocyclyl may be mono- or disubstituted by halogen, alkyl having 1 to 4 carbon atoms, cyano, nitro and/or cycloalkyl having 3 to 6 carbon atoms,
- R^2 represents hydrogen or alkyl having 1 to 4 carbon atoms, or
- 20 R^1 and R^2 together with the nitrogen atom to which they are attached represent a saturated or unsaturated heterocyclic ring having 3 to 6 ring members, where the heterocycle may contain a further nitrogen, oxygen or sulfur atom as ring member and where the heterocycle may be substituted up to three times by fluorine, chlorine, bromine, alkyl having 1 to 4 carbon atoms and/or haloalkyl having 1 to 4 carbon atoms and 1 to 9 fluorine and/or chlorine atoms,
- 25 R^3 represents hydrogen, fluorine, chlorine, bromine, iodine, alkyl having 1 to 4 carbon atoms, haloalkyl having 1 to 4 carbon atoms and 1 to 9 halogen atoms or represents cycloalkyl having 3 to 6 carbon atoms,
- R^4 represents haloalkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, alkynyl having 2 to 6 carbon atoms, cycloalkyl having 3 to 6 carbon atoms or represents benzyl,
- 30 R^5 represents fluorine, chlorine, bromine, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, alkylsulfinyl having 1 to 4 carbon atoms or alkylsulfonyl having 1 to 4 carbon atoms, and

R⁶ represents phenyl which may be mono- to tetrasubstituted by identical or different substituents from the group consisting of halogen, cyano, nitro, amino, hydroxyl, formyl, carboxyl, carbamoyl, thiocarbamoyl;

in each case straight-chain or branched alkyl, alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl having in each case 1 to 6 carbon atoms;

in each case straight-chain or branched haloalkyl, haloalkoxy, haloalkylthio, haloalkylsulfinyl or haloalkylsulfonyl having in each case 1 to 6 carbon atoms and 1 to 13 identical or different halogen atoms;

in each case straight-chain or branched haloalkenyl or haloalkenyloxy having in each case 2 to 6 carbon atoms and 1 to 11 identical or different halogen atoms;

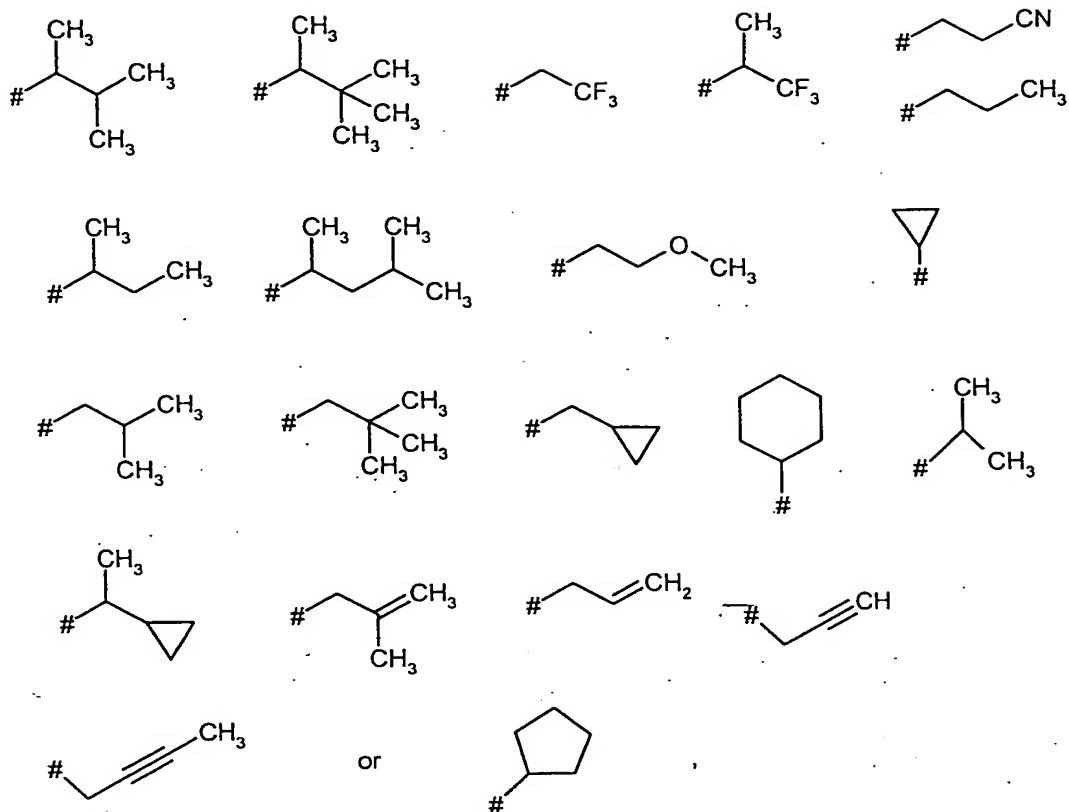
in each case straight-chain or branched alkylamino, dialkylamino, alkylcarbonyl, alkylcarbonyloxy, alkoxycarbonyl, alkylsulfonyloxy, hydroximinoalkyl or alkoximinoalkyl having in each case 1 to 6 carbon atoms in the individual alkyl moieties;

cycloalkyl having 3 to 6 carbon atoms,

2,3-attached 1,3-propanediyl, 1,4-butanediyl, methylenedioxy (-O-CH₂-O-) or 1,2-ethylenedioxy (-O-CH₂-CH₂-O-), where these radicals may be mono- or polysubstituted by identical or different substituents from the group consisting of halogen, alkyl having 1 to 4 carbon atoms and haloalkyl having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms.

3. The pyrazolopyrimidine of the formula (I) as claimed in claim 1 or 2, in which

R¹ represents a radical of the formula



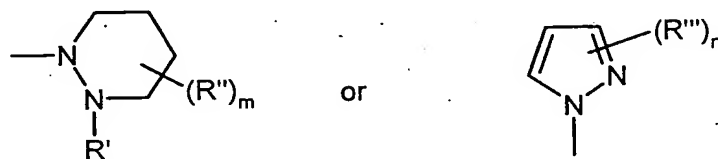
where # denotes the point of attachment and where, for the radicals which may be present in optically active form, each of the possible stereoisomers or mixtures thereof may be present,

5 R^2 represents hydrogen, methyl, ethyl or propyl, or

R^1 and R^2 together with the nitrogen atom to which they are attached represent pyrrolidinyl, piperidinyl, morpholinyl, thiomorpholinyl, piperazinyl, 3,6-dihydro-1(2H)-piperidinyl or tetrahydro-1(2H)-pyridazinyl, where these radicals may be substituted by 1 to 3 fluorine atoms, 1 to 3 methyl groups and/or trifluoromethyl,

10 or

R^1 and R^2 together with the nitrogen atom to which they are attached represent a radical of the formula



in which

R' represents hydrogen or methyl,

R'' represents methyl, ethyl, fluorine, chlorine or trifluoromethyl,

5 m represents the number 0, 1, 2 or 3, where R'' represents identical or different radicals, if m represents 2 or 3,

R''' represents methyl, ethyl, fluorine, chlorine or trifluoromethyl

and

10 n represents the number 0, 1, 2 or 3, where R''' represents identical or different radicals if n represents 2 or 3,

R³ represents hydrogen, fluorine, chlorine, bromine, iodine, methyl, ethyl, isopropyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, trifluoromethyl, 1-trifluoromethyl-2,2,2-trifluoroethyl or heptafluoroisopropyl,

15 R⁴ represents haloalkyl having 1 to 4 carbon atoms, alkenyl having 3 to 5 carbon atoms, alkynyl having 3 to 5 carbon atoms, cyclopropyl, cyclopentyl, cyclohexyl or represents benzyl,

R⁵ represents fluorine, chlorine, bromine, methyl, ethyl, methoxy, ethoxy, methylthio, methylsulfinyl or methylsulfonyl, and

20 R⁶ represents phenyl which may be mono- to trisubstituted by identical or different substituents from the group consisting of fluorine, chlorine, bromine, cyano, nitro, formyl, methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, allyl, propargyl, methoxy, ethoxy, n- or i-propoxy, methylthio, ethylthio, n- or i-propylthio, methylsulfinyl, ethylsulfinyl, methylsulfonyl, ethylsulfonyl, allyloxy, propargyloxy, trifluoromethyl, trifluoroethyl, difluoromethoxy, trifluoromethoxy, difluorochloromethoxy, trifluoroethoxy, difluoromethylthio, difluorochloromethylthio, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl, trichloroethynyloxy, trifluoroethynyloxy, chloroallyloxy, iodopropargyloxy, methylamino, ethylamino, n- or i-propylamino, dimethylamino, diethylamino, acetyl, propionyl, acetyloxy, methoxycarbonyl, ethoxycarbonyl, hydroximinomethyl, hydroximinoethyl,

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methoximinomethyl, ethoximinomethyl; methoximinoethyl, ethoximinoethyl, cyclopropyl, cyclobutyl, cyclopentyl or cyclohexyl,

2,3-attached 1,3-propanediyl, methylenedioxy (-O-CH₂-O-) or 1,2-ethylenedioxy (-O-CH₂-CH₂-O-), where these radicals may be mono- or polysubstituted by identical or different substituents from the group consisting of fluorine, chlorine, methyl, ethyl, n-propyl, i-propyl and trifluoromethyl.

4. The pyrazolopyrimidine of the formula (I) as claimed in one or more of claims 1 to 3, in which

R⁴ represents CF₃, CCl₃, allyl, propargyl, cyclopropyl or benzyl,

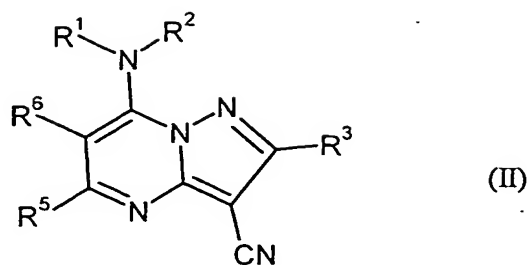
R⁵ represents fluorine, chlorine, bromine, methyl, methoxy or methylthio and

R⁶ represents 2,4-, 2,5- or 2,6-disubstituted phenyl or 2-substituted phenyl or represents 2,4,6-trisubstituted phenyl, where the substituents are selected from the group consisting of fluorine, chlorine, bromine, cyano, nitro, formyl, methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, allyl, propargyl, methoxy, ethoxy, n- or i-propoxy, methylthio, ethylthio, n- or i-propylthio, methylsulfinyl, ethylsulfinyl, methylsulfonyl, ethylsulfonyl, allyloxy, propargyloxy, trifluoromethyl, trifluoroethyl, difluoromethoxy, trifluoromethoxy, difluorochloromethoxy, trifluoroethoxy, difluoromethylthio, difluorochloromethylthio, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl, trichloroethynyloxy, trifluoroethynyloxy, chloroallyloxy, iodopropargyloxy, methylamino, ethylamino, n- or i-propylamino, dimethylamino, diethylamino, acetyl, propionyl, acetyloxy, methoxycarbonyl, ethoxycarbonyl, hydroximinomethyl, hydroximinoethyl, methoximinomethyl, ethoximinomethyl; methoximinoethyl, ethoximinoethyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl,

2,3-attached 1,3-propanediyl, methylenedioxy (-O-CH₂-O-) and 1,2-ethylenedioxy (-O-CH₂-CH₂-O-), where these radicals may be mono- or polysubstituted by identical or different substituents from the group consisting of fluorine, chlorine, methyl, ethyl, n-propyl, i-propyl and/or trifluoromethyl.

5. A process for preparing pyrazolopyrimidines of the formula (I) according to claim 1, characterized in that

a) cyano compounds of the formula



in which

R^1 , R^2 , R^3 , R^5 and R^6 are as defined above

are reacted with Grignard compounds of the formula



in which

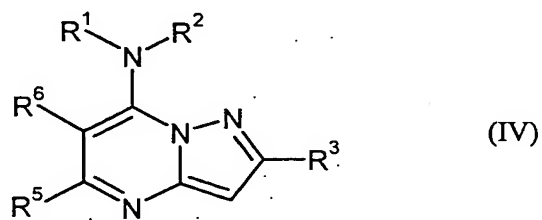
R^7 represents substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl or optionally substituted benzyl and

10 X represents chlorine, bromine or iodine

in the presence of a catalyst and in the presence of a diluent,

or

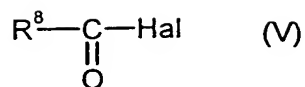
b) pyrazolopyrimidines of the formula



15 in which

R^1 , R^2 , R^3 , R^5 and R^6 are as defined above

are reacted with acid halides of the formula



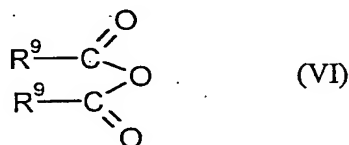
in which

R^8 represents substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl or optionally substituted benzyl and

Hal represents chlorine or bromine,

or

with acid anhydrides of the formula



in which

R^9 represents substituted alkyl or optionally substituted benzyl,

or other activated carboxylic acid derivatives, such as 4-dimethylaminopyridine acid anhydride adducts,

in each case in the presence of a catalyst and, if appropriate, in the presence of a diluent.

6. A composition for controlling unwanted microorganisms, characterized in that it comprises at least one pyrazolopyrimidine of the formula (I) as claimed in one or more of claims 1 to 4, in addition to extenders and/or surfactants.
7. The composition as claimed in claim 6, comprising at least one further fungicidally or insecticidally active compound.
8. The use of pyrazolopyrimidines of the formula (I) as claimed in one or more of claims 1 to 4 for controlling unwanted microorganisms.

9. A method for controlling unwanted microorganisms, characterized in that pyrazolopyrimidines of the formula (I) as claimed in one or more of claims 1 to 4 are applied to the unwanted microorganisms and/or their habitat.
10. A process for preparing compositions for controlling unwanted microorganisms,
5 characterized in that pyrazolopyrimidines of the formula (I) as claimed in one or more of claims 1 to 4 are mixed with extenders and/or surfactants.